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Craig M. Lundell

Date: June 20, 2007

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF APPEALS AND INTERFERENCES

In re the application of)	
)	
JOHANNES A. M. VAN BROEKHOVEN and)	
CAROLUS M. A. M. MESTERS)	
)	
Serial No. 10/786,447)	Group Art Unit: 1764
)	
Filed February 25, 2004)	Examiner: John C. Douglas
)	
PROCESS FOR THE PREPARATION OF)	June 20, 2007
STYRENE)	
)	

COMMISSIONER FOR PATENTS
P. O. Box 1450
Alexandria, VA 22313-1450

Sir:

APPEAL BRIEF

Applicants hereby submit this Appeal Brief in order to appeal the final rejection of claims 1 to 4 mailed November 1, 2006. Please charge the \$500 fee for the filing of this brief to Shell Oil Company, Deposit Account No. 19-1800. A request for a two-month extension of time accompanies this Appeal Brief.

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Real Party in Interest

The real party in interest is Shell Oil Company.

Related Appeals and Interferences

To the best of the undersigned's knowledge, there are no related appeals or interferences.

Status of the Claims

Claims 1 to 4 were originally presented for examination. The claims were finally rejected on November 1, 2006.

Status of Amendments

No amendments to the claims have been filed.

Summary of Claimed Subject Matter

The invention as set forth in claim 1 is directed to a process for the preparation of styrene comprising the gas phase dehydration of 1-phenylethanol at elevated temperature in the presence of a dehydration catalyst, in which the dehydration catalyst comprises shaped alumina catalyst particles having a surface area (BET) of from 80 to 140 m²/g and a pore volume (Hg) of more than 0.65 ml/g. See specification page 2, line 29, to page 3, line 2. The BET surface area may be measured in any way known to be suitable to one skilled in the art. The expression pore volume (Hg) stands for the pore volume as measured with mercury. Suitable methods for measuring the porosity with mercury are also well known to someone skilled in the art. See specification page 3, lines 28-33. Processes for forming the shaped alumina catalyst are described in the specification at page 4, line 1 through page 6, line 2.

Grounds of Rejection to be Reviewed on Appeal

In the final office action, claim 1 was rejected under 35 USC 103(a) as obvious over Dirkzwager (WO 99/58480).

In the final office action, claims 1 to 4 were rejected under 35 USC 103(a) as being unpatentable over Dirkzwager in view of Jacques (US 4,273,735).

Argument

Rejection of Claim 1 under 35 USC 103(a) over Dirkzwager

As noted by the Examiner in the office action, Dirkzwager discloses a process for the preparation of styrene comprising the dehydration of 1-phenylethanol in the presence of a dehydration catalyst where the catalyst consists of shaped alumina catalyst particles having a surface area (BET) in the range of from 80 to 140 m²/g and a pore volume (Hg) in the range of 0.35 to 0.65 ml/g. Claim 1 of the present application is directed to a process for the preparation of styrene in which the dehydration catalyst has a pore volume of more than 0.65 ml/g. As demonstrated by the examples in the application, the present invention provides superior results when compared to the process of Dirkzwager. Accordingly, Applicants submit that it would not have been obvious to modify Dirkzwager to utilize a larger pore volume catalyst.

In the office action, the Examiner responded to the arguments which had been presented by Applicants and stated, "In this case, the catalyst of the prior art reads on the claims of Applicant's invention." Applicants disagree. The catalyst of Dirkzwager does not read on the catalyst set forth in claim 1. The Examiner earlier recognized this when he removed the rejection under 35 USC 102.

Additionally, Applicants submit that there is no teaching or suggestion in Dirkzwager to utilize a larger pore volume catalyst than that specifically disclosed. The Examiner has presented no argument nor has he identified any evidence in Dirkzwager which would suggest use of a larger pore volume catalyst. Additionally, the fact that Applicants have shown that the claimed invention provides superior results to the disclosure of Dirkzwager, substantiates the nonobviousness of the claimed invention.

Accordingly, Applicants submit that claim 1 would not have been obvious over Dirkzwager and reversal of the rejection is requested.

Rejection of Claims 1 to 4 Under 35 USC 103(a) over Dirkzwager in view of Jacques

In the final office action, the Examiner rejected claims 1 to 4 under 35 USC 103(a) as being unpatentable over Dirkzwager in view of Jacques. The Examiner claimed that Dirkzwager discloses everything in paragraph 4 [*sic*] but does not disclose where the alumina catalyst is pseudo-boehmite and where the catalyst has a pore volume of from 0.75 to 0.85 ml/g. Jacques

discloses an alumina catalyst prepared from boehmite having a pore volume of from 0.3 to 2.8 cm³/g.

Jacques is directed to a process for the production spheroidal alumina shaped particles. Additionally as set forth in column 7, lines 10 to 24, the alumina spheres of Jacques can be used as catalysts, supports, or carriers for many different types of reactions.

There is no teaching or suggestion in Jacques that particles having a size greater than 0.65 ml/g would provide better results than a catalyst having a smaller pore volume in a process for the preparation of styrene. Accordingly, there is no teaching or suggestion to combine the teachings of Jacques with the teachings of Dirkzwager to arrive at the present invention. The mere fact that elements of the claimed invention can be identified in different references does not of itself establish that the claimed invention would have been obvious. This is especially true when there is no teaching or suggestion to actually combine the various elements and where the claimed invention provides superior results to the closest prior art. It is only through hindsight with the benefit of Applicant's disclosure that it can be argued that the present invention would have been obvious.

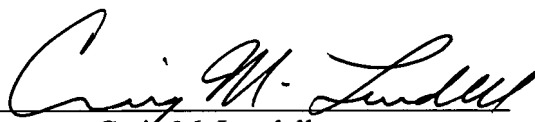
Accordingly, Applicants submit that it would not have been obvious to combine the teachings of Dirkzwager and Jacques to arrive at the present invention. Applicants request that this rejection of claims 1 to 4 be reversed.

Conclusion

Based on the foregoing arguments, Applicants assert that the claims of the present application would not have been obvious in view of the cited references. It is respectfully requested that this appeal be upheld and that the application be sent back to the Examiner for allowance.

Respectfully submitted,

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CLAIMS APPENDIX

1. A process for the preparation of styrene comprising dehydrating gas phase 1-phenylethanol at elevated temperatures in the presence of a dehydration catalyst, in which the dehydration catalyst comprises shaped alumina catalyst particles having a surface area (BET) of from 80 m²/g to 140 m²/g and a pore volume of more than 0.65 ml/g.
2. The process of claim 1 in which the alumina catalyst is prepared from pseudo-boehmite.
3. The process of claim 1 in which the catalyst has a pore volume (Hg) of from 0.75 ml/g to 0.85 ml/g.
4. The process of claim 3 in which the alumina catalyst is prepared from pseudo-boehmite.

EVIDENCE APPENDIX

None.

RELATED PROCEEDINGS APPENDIX

None.